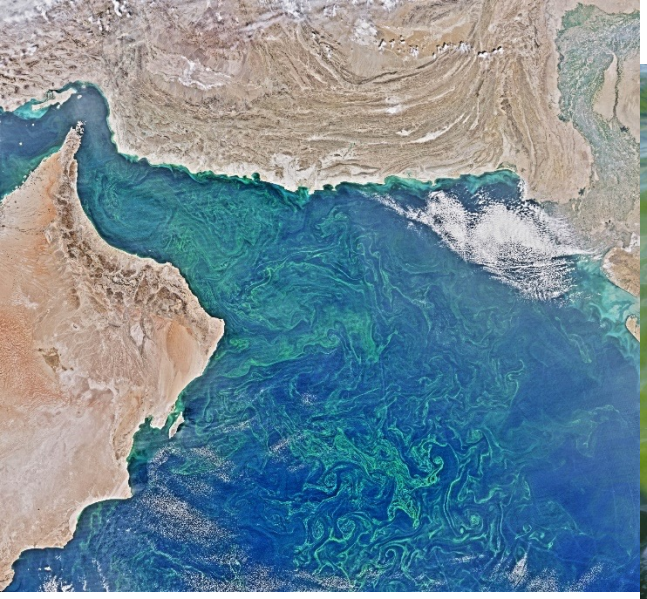

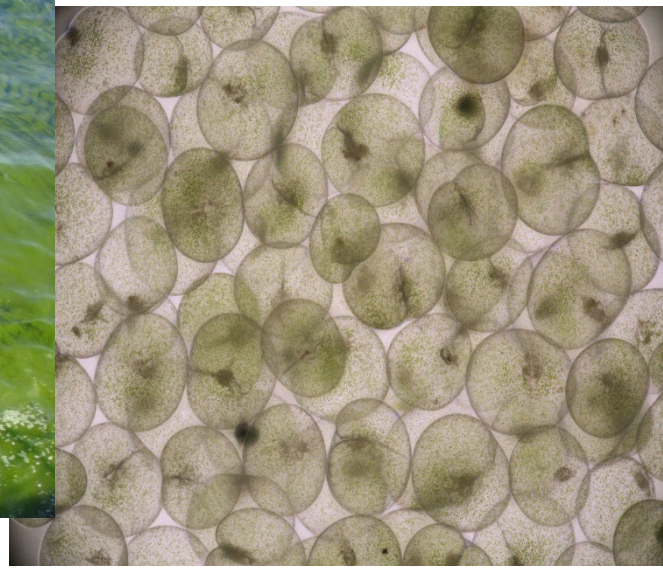

Decision and Information System for the Coastal waters of Oman (DISCO)
An integrative tool for managing coastal resources under changing climate

Joaquim I. Goes

Lamont Doherty Earth Observatory at Columbia University

NASA

ECOLOGICAL FORECASTING

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Naval Research Laboratory, Mississippi, USA

Dale Kiefer and Zach Siegrist
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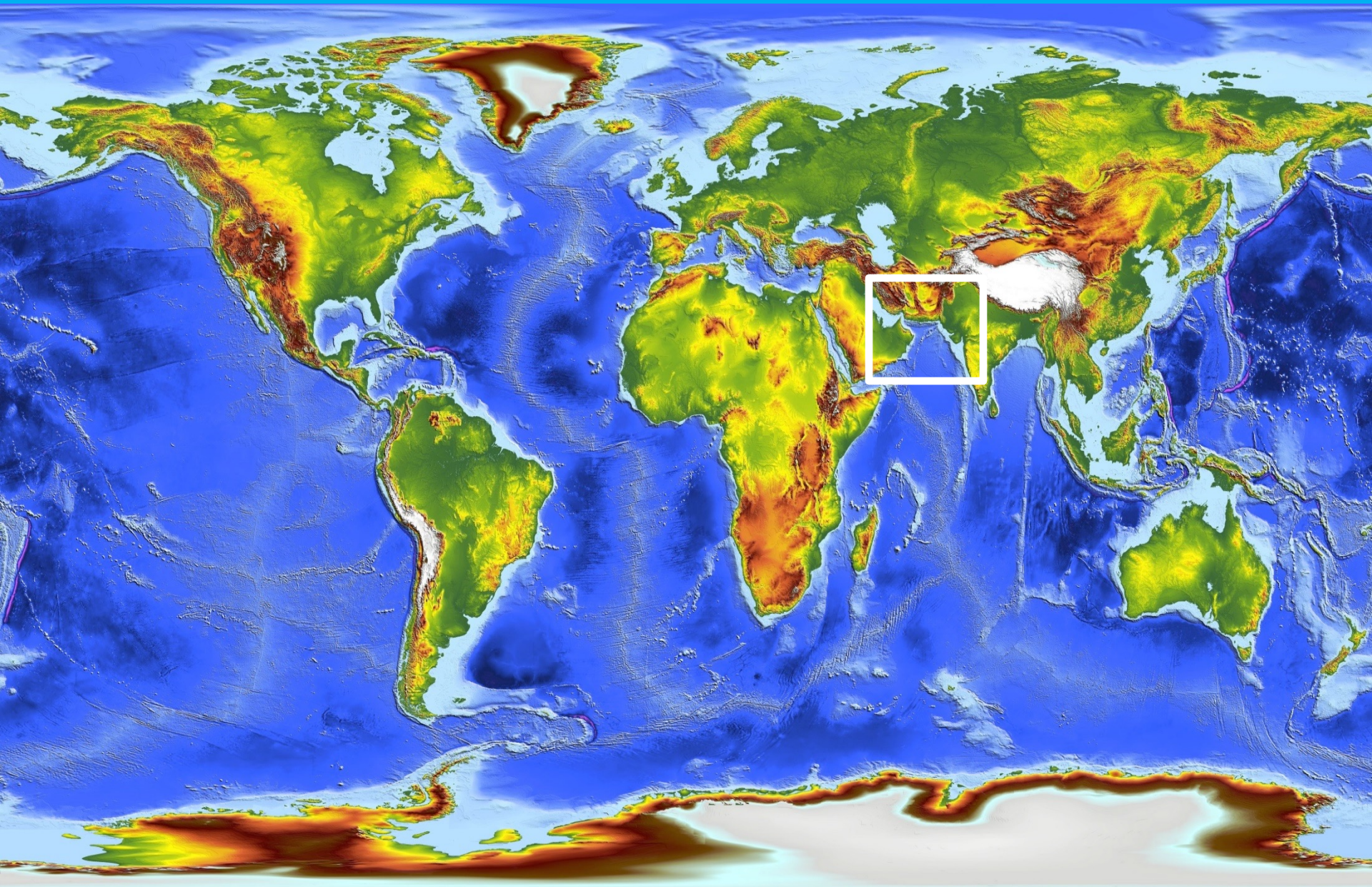
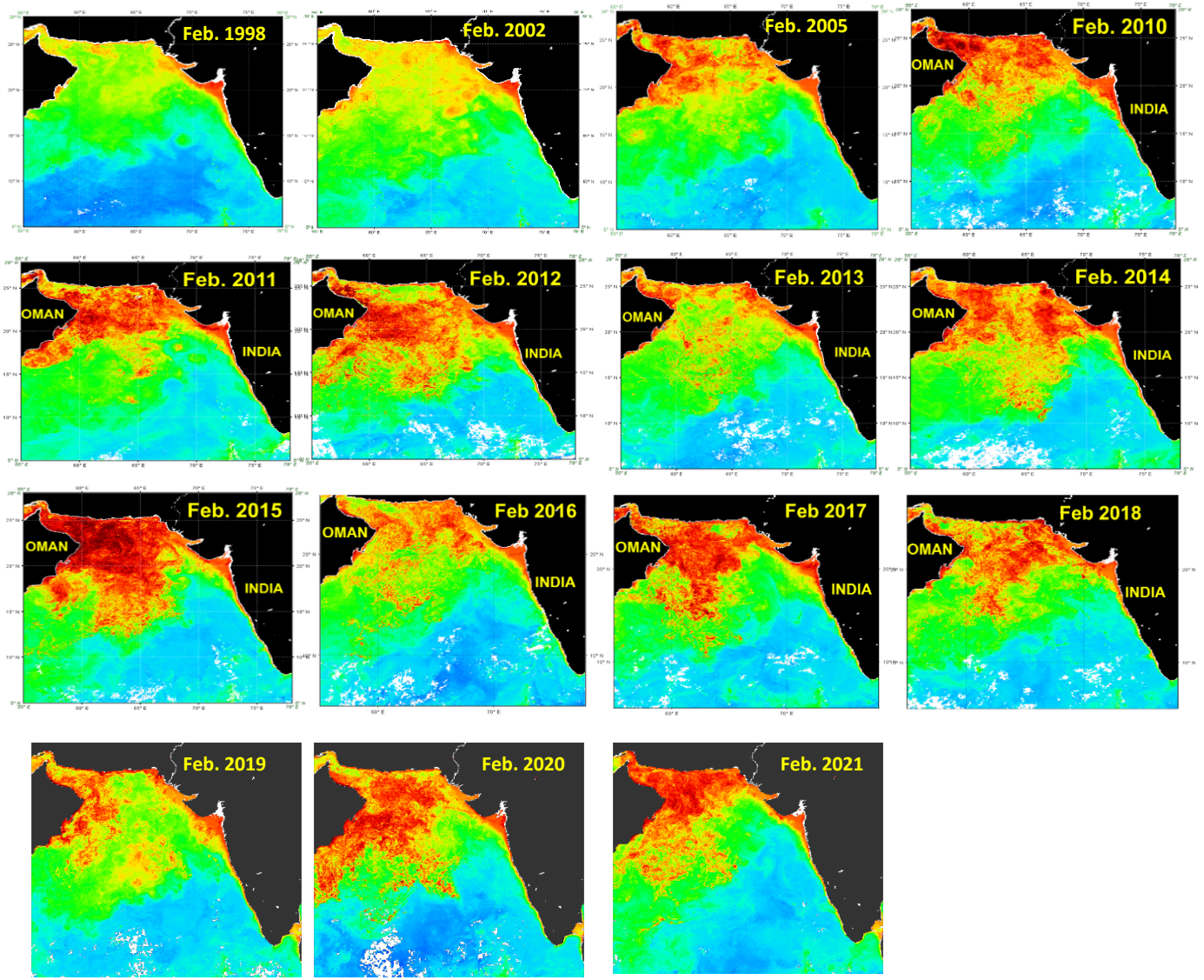
Ministry of Agriculture and Fisheries Wealth
Sultanate of Oman Muscat, Oman

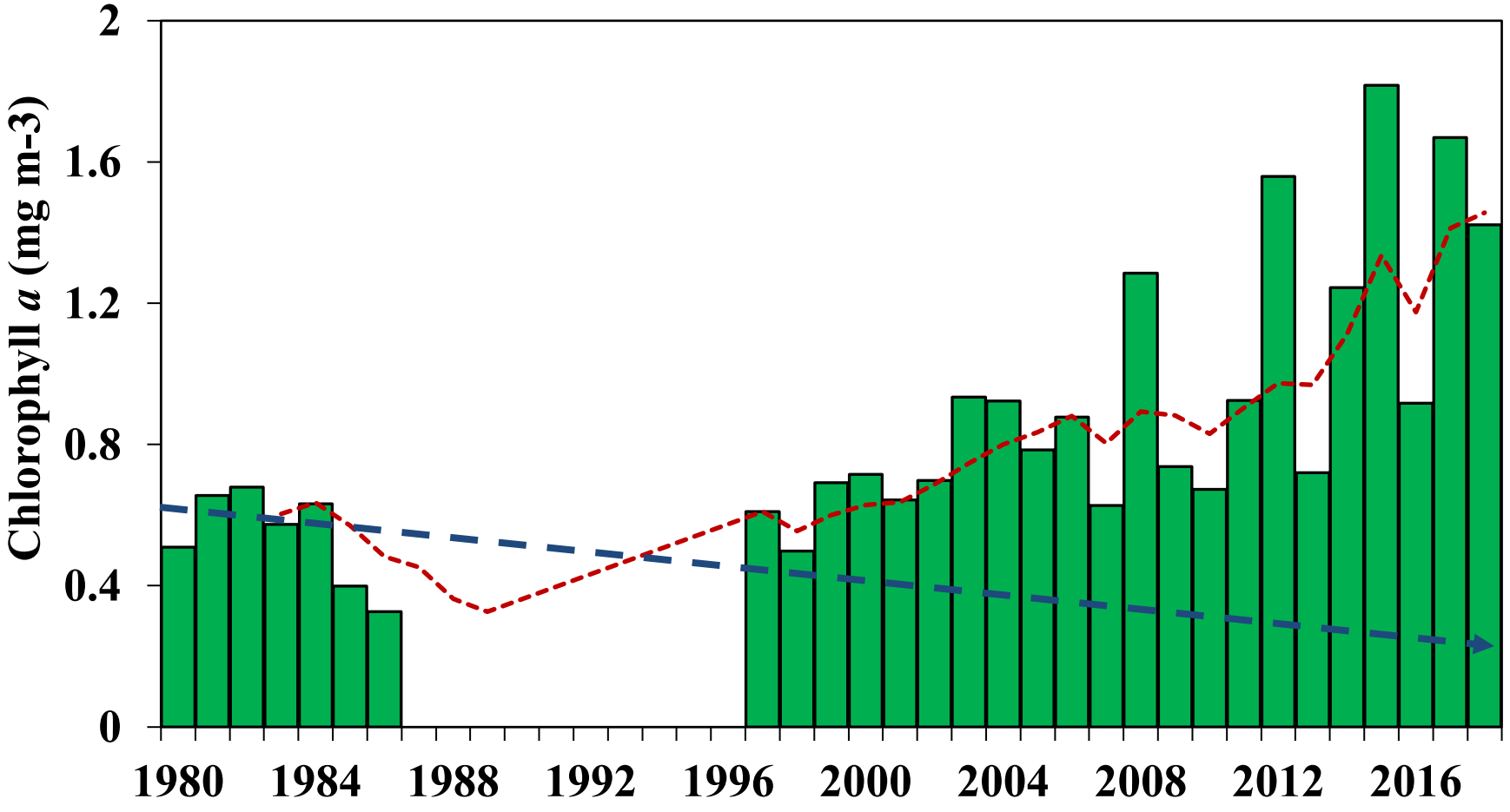
Khalid Al-Hashmi
Sultan Qaboos University, Muscat, Oman

THE ARABIAN SEA IN THE CONTEXT OF THE WORLD'S OCEANS

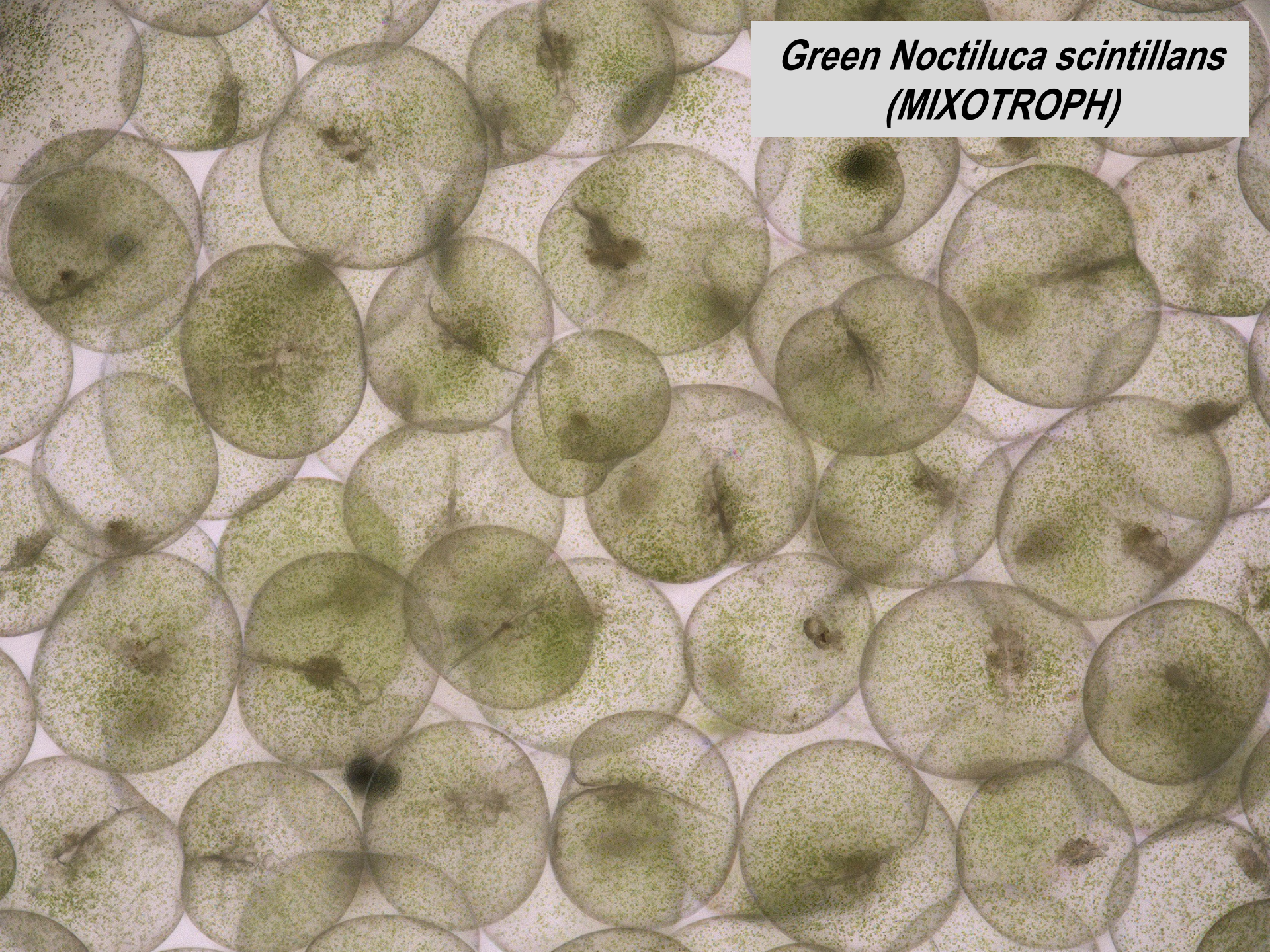


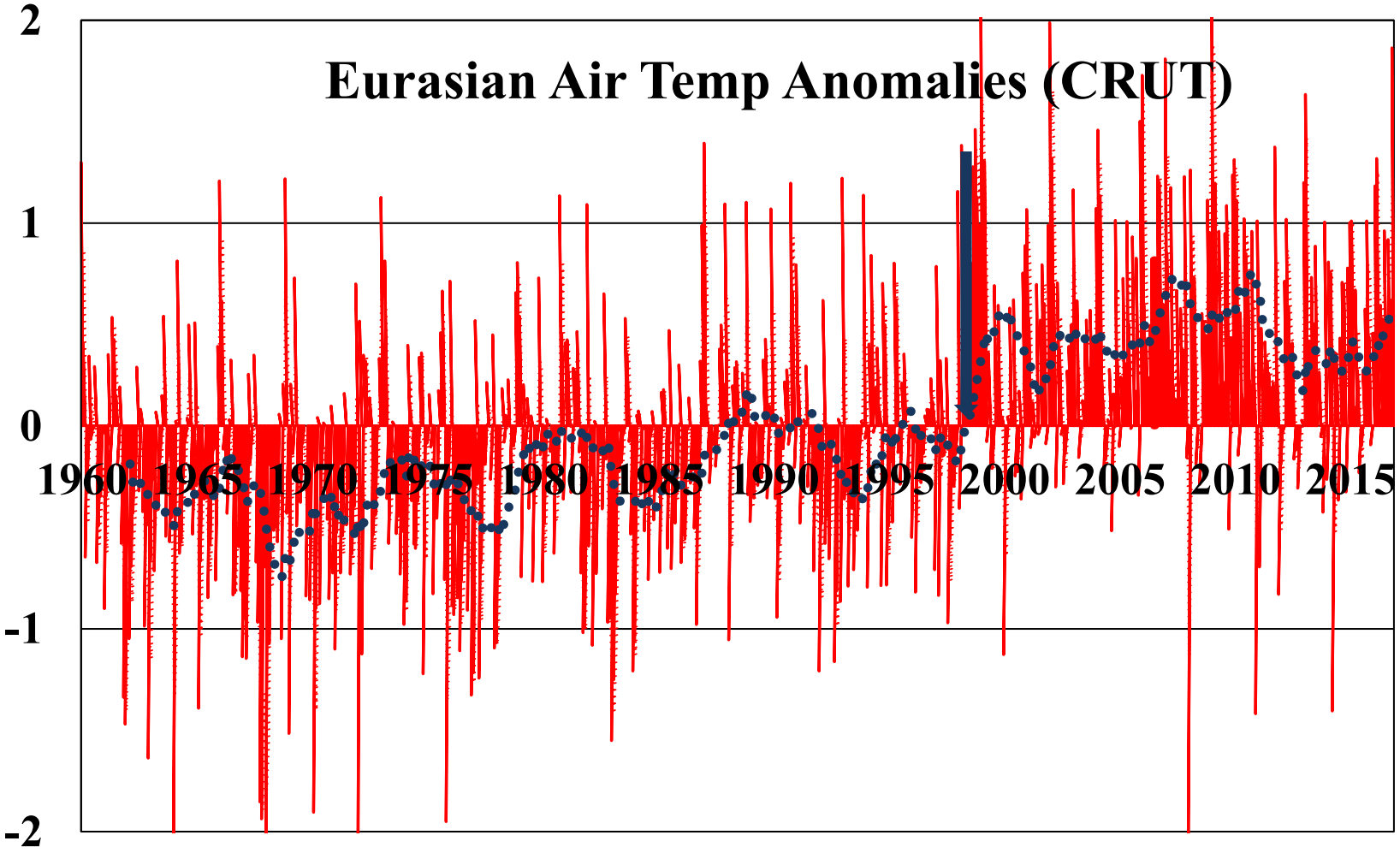


NASA's SeaWIFS and MODIS-Aqua monthly composite images of Chl *a* in the Arabian Sea showing the spatial expanse of *Noctiluca* blooms

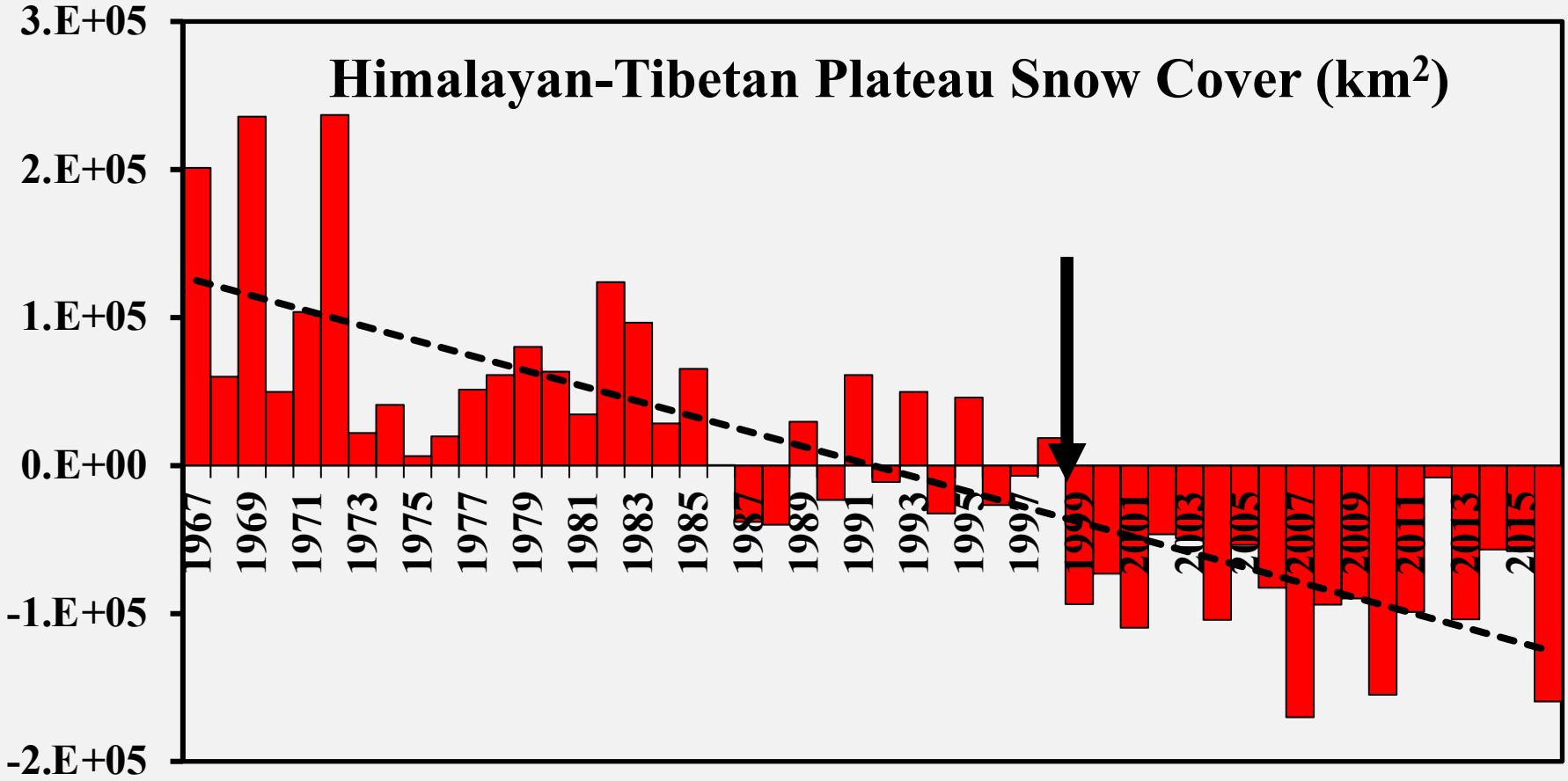


Trends in area averaged (Arabian Sea) Chlorophyll *a* during winter

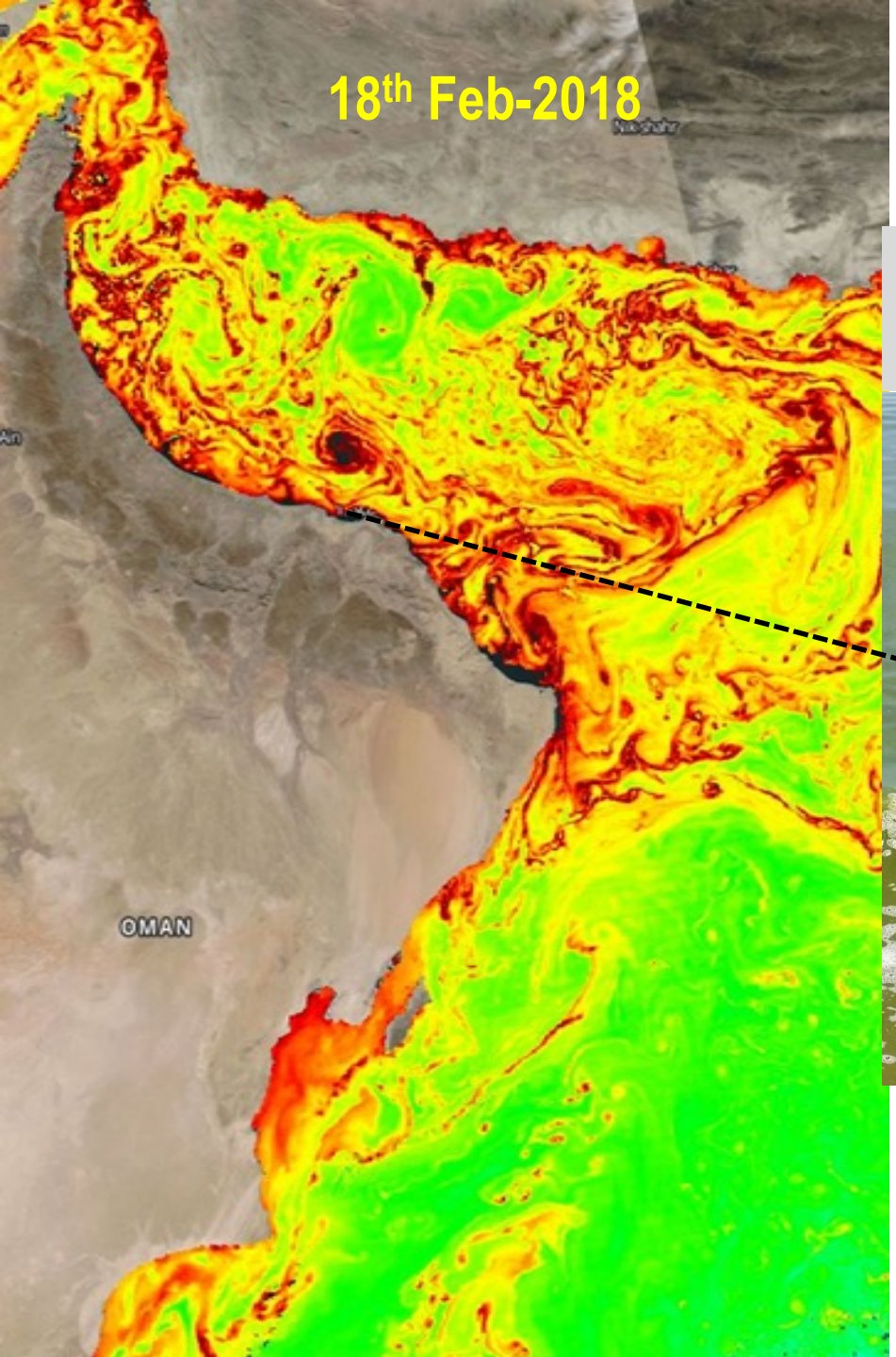

Green Noctiluca scintillans
(MIXOTROPH)



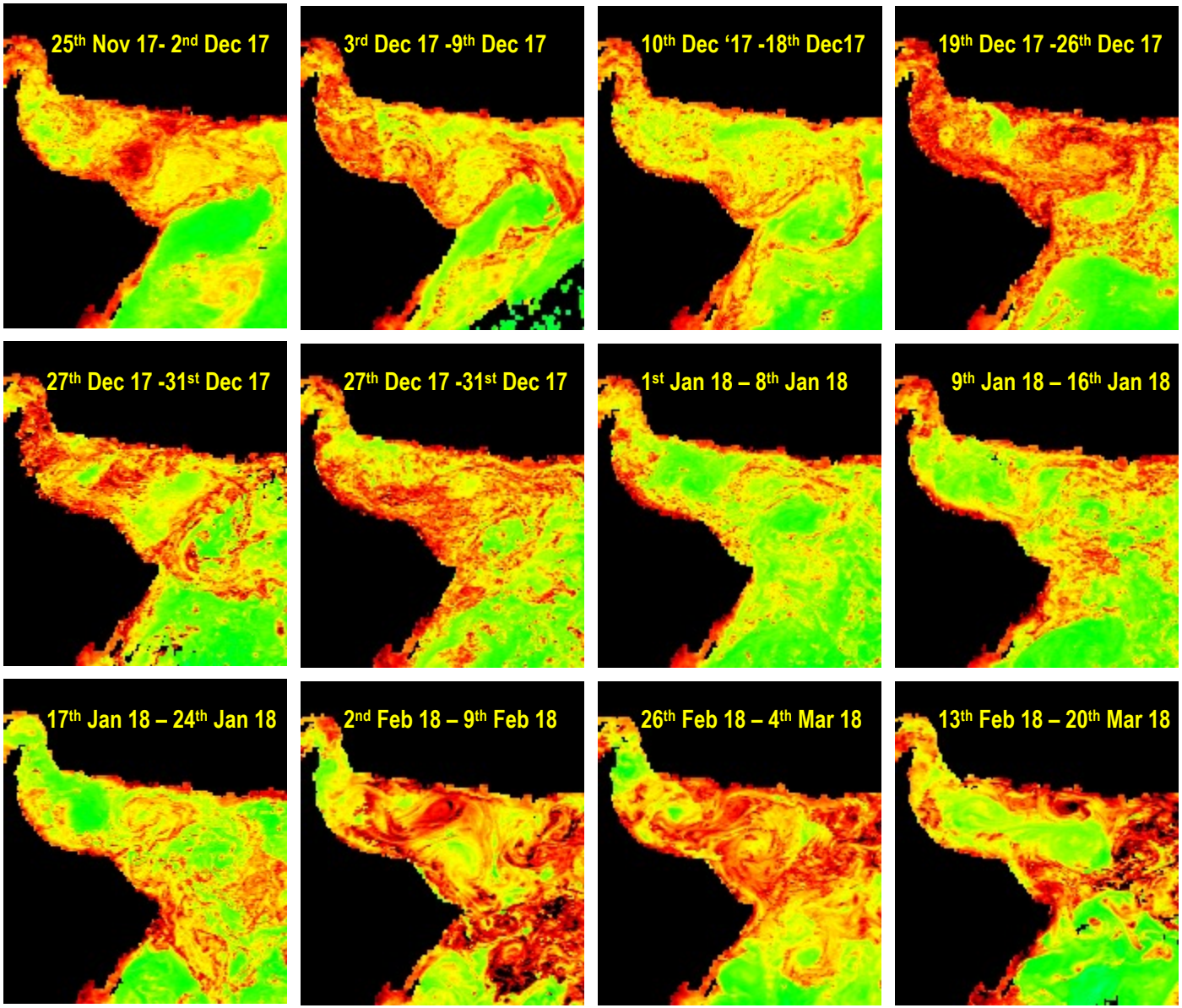
Annual trends of air temperature over the Eurasian Continent



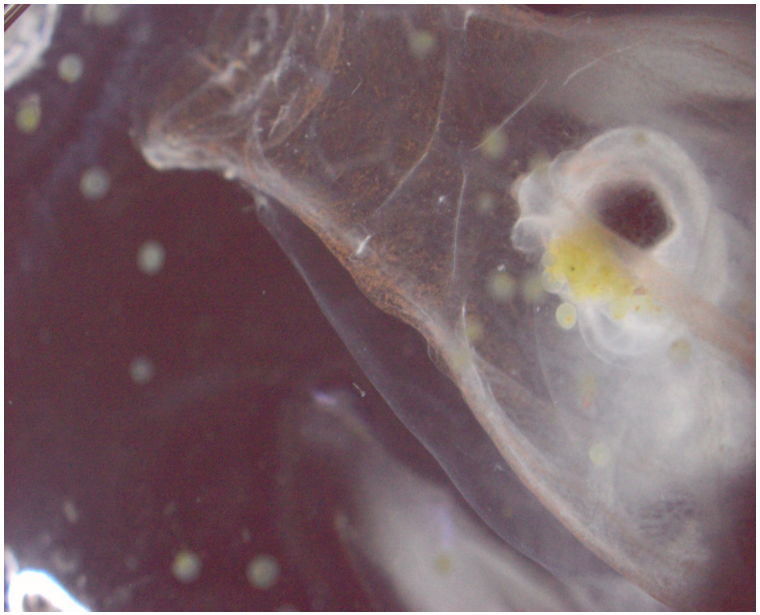
Annual trends of snow cover extent over the Himalayan-Tibetan Plateau Region

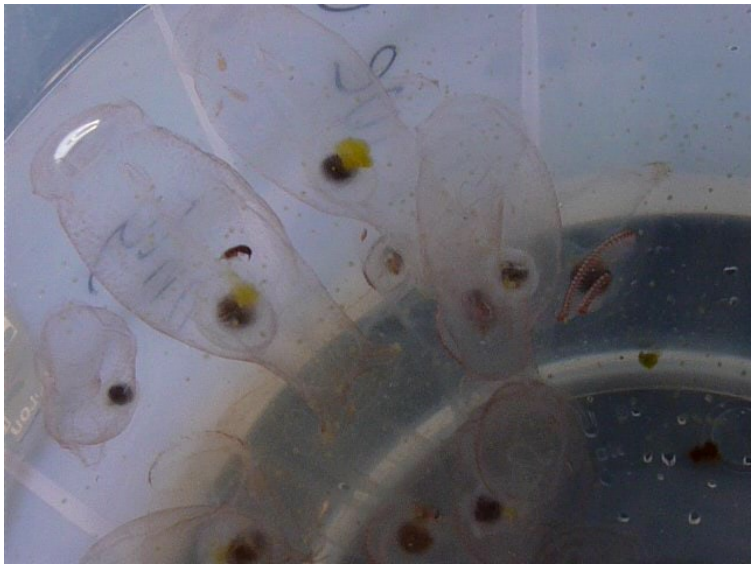


Green *NOCTILUCA* blooms Muscat. Oman

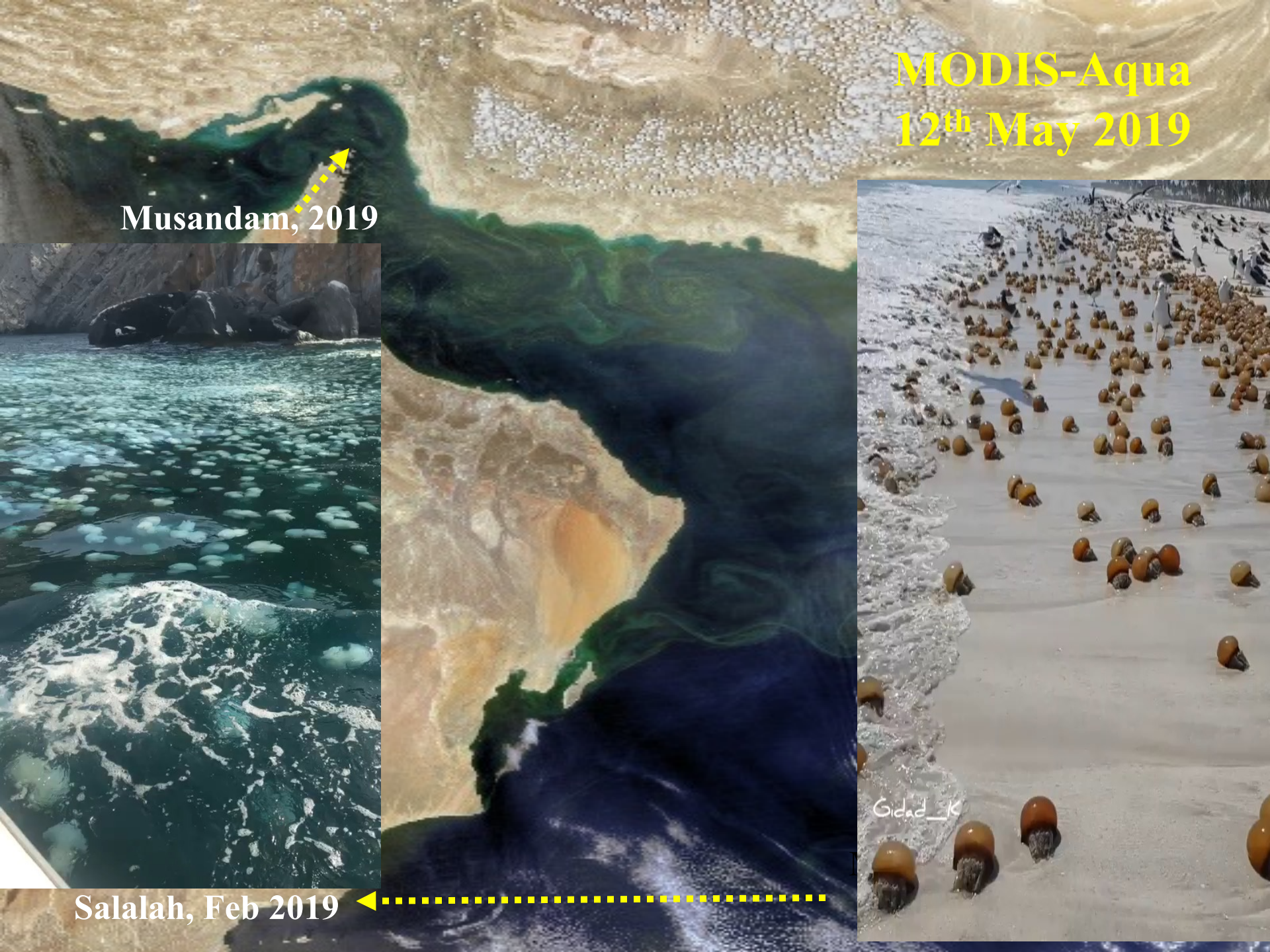


Role of meso- and microscale eddies in the evolution of Chl-*a* in the Sea of Oman





Salps - the largest consumer of *Noctiluca*

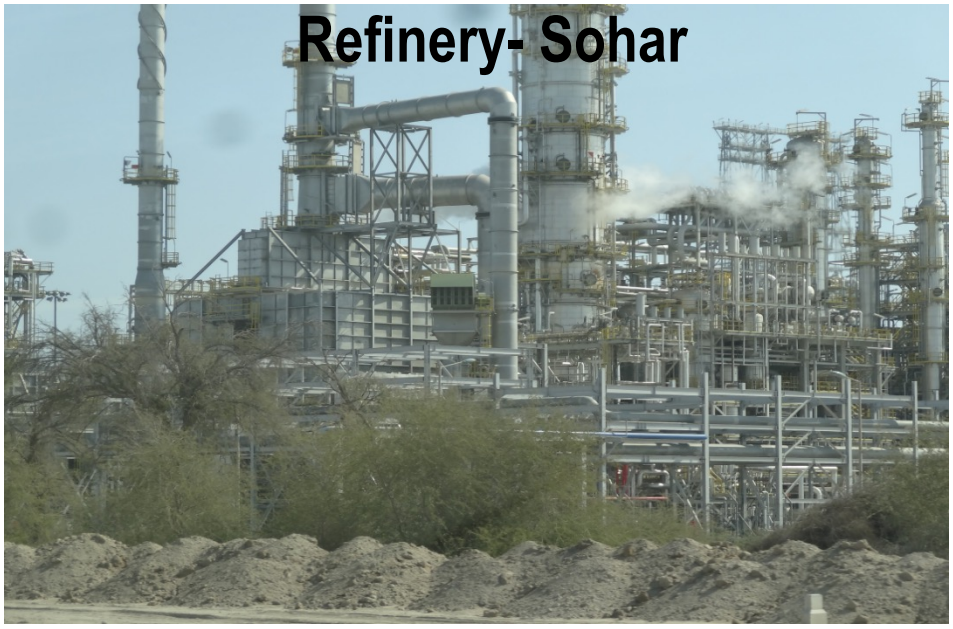

MODIS-Aqua
12th May 2019
Musandam, 2019
Salalah, Feb 2019

Jellyfish blooms at sea and along the shore in seawater intake

Royal Oman Navy

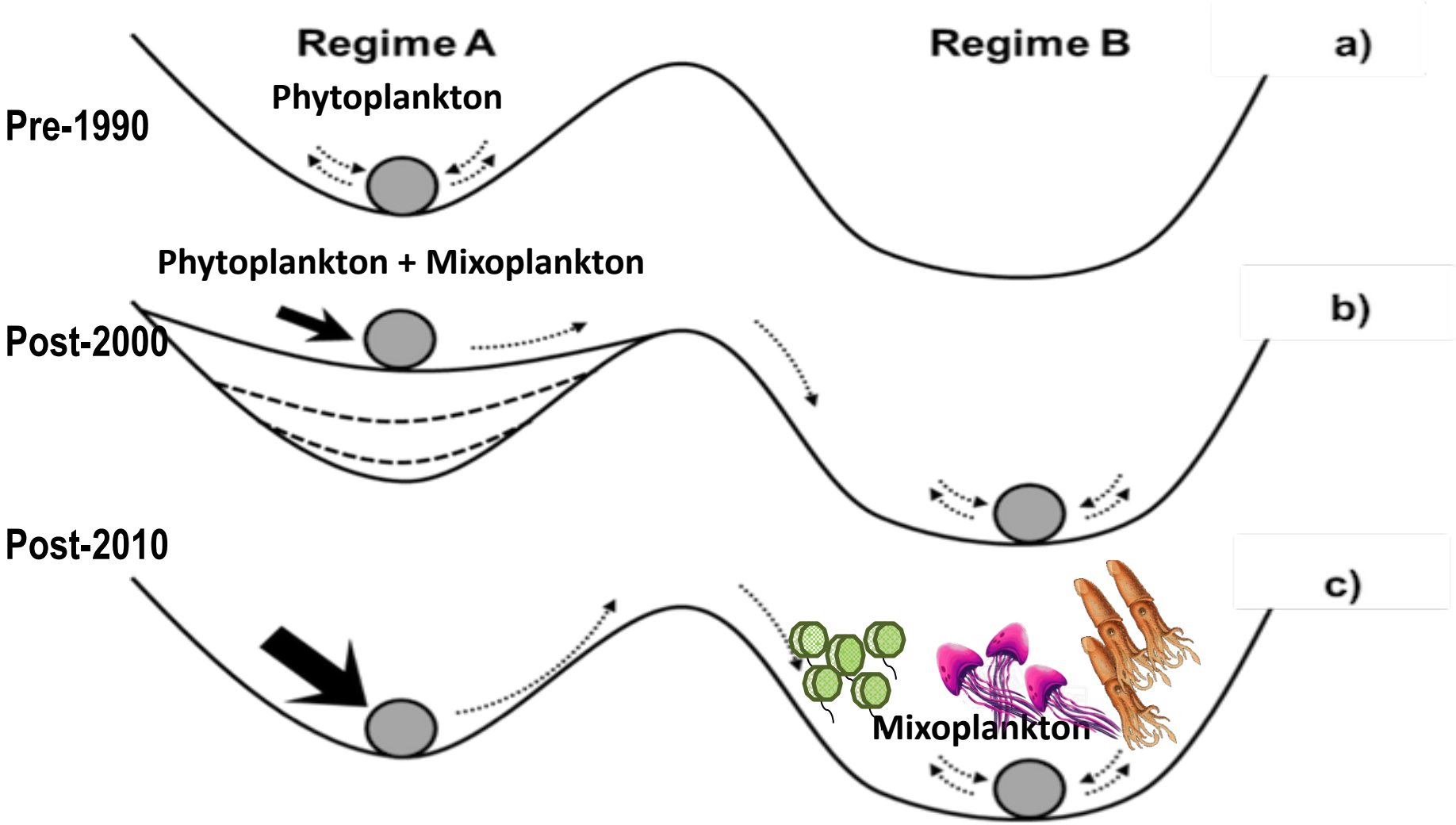
Fish-farm- Quaryat

Refinery- Sohar

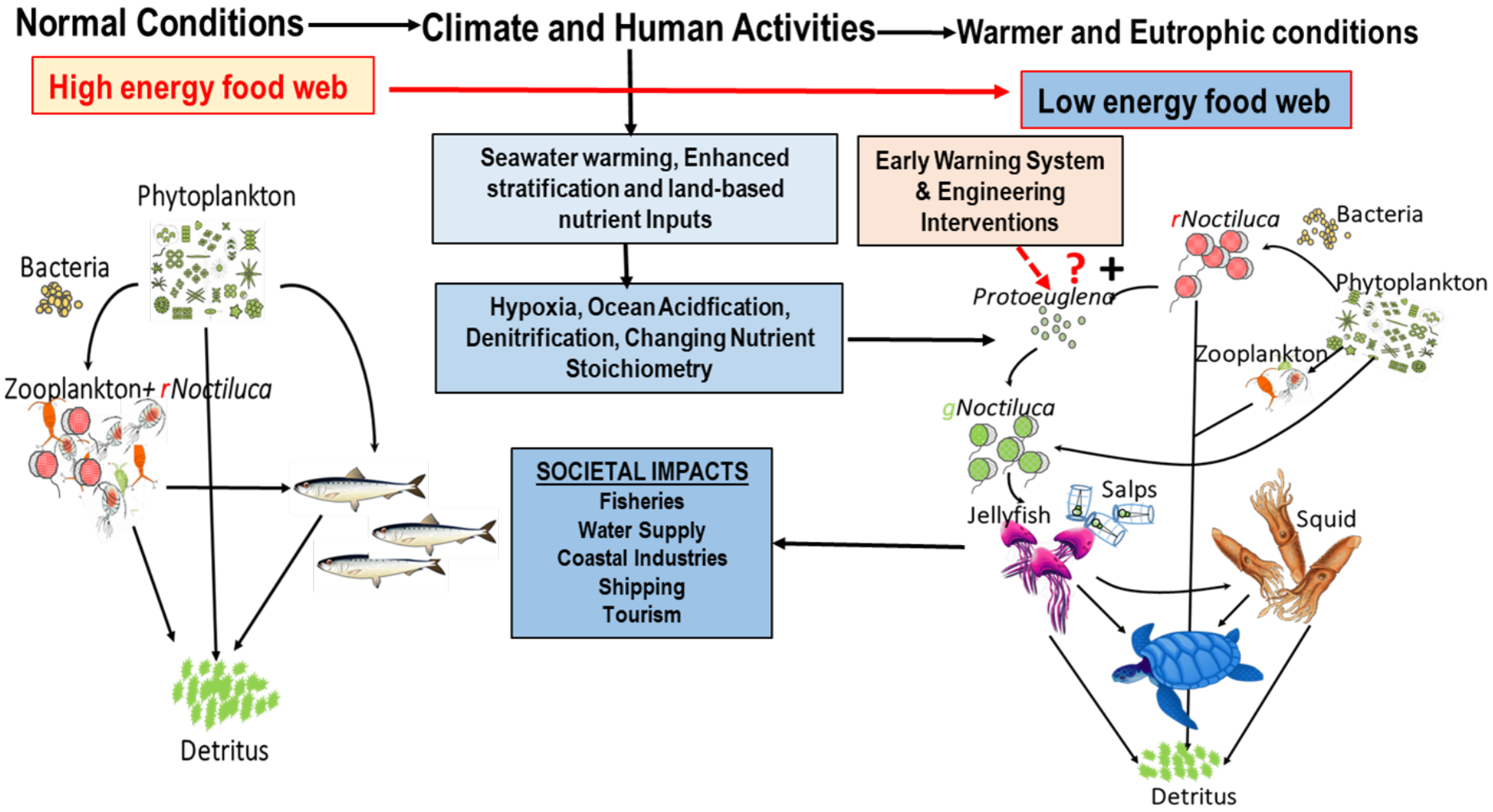


Desalination plant - Sohar

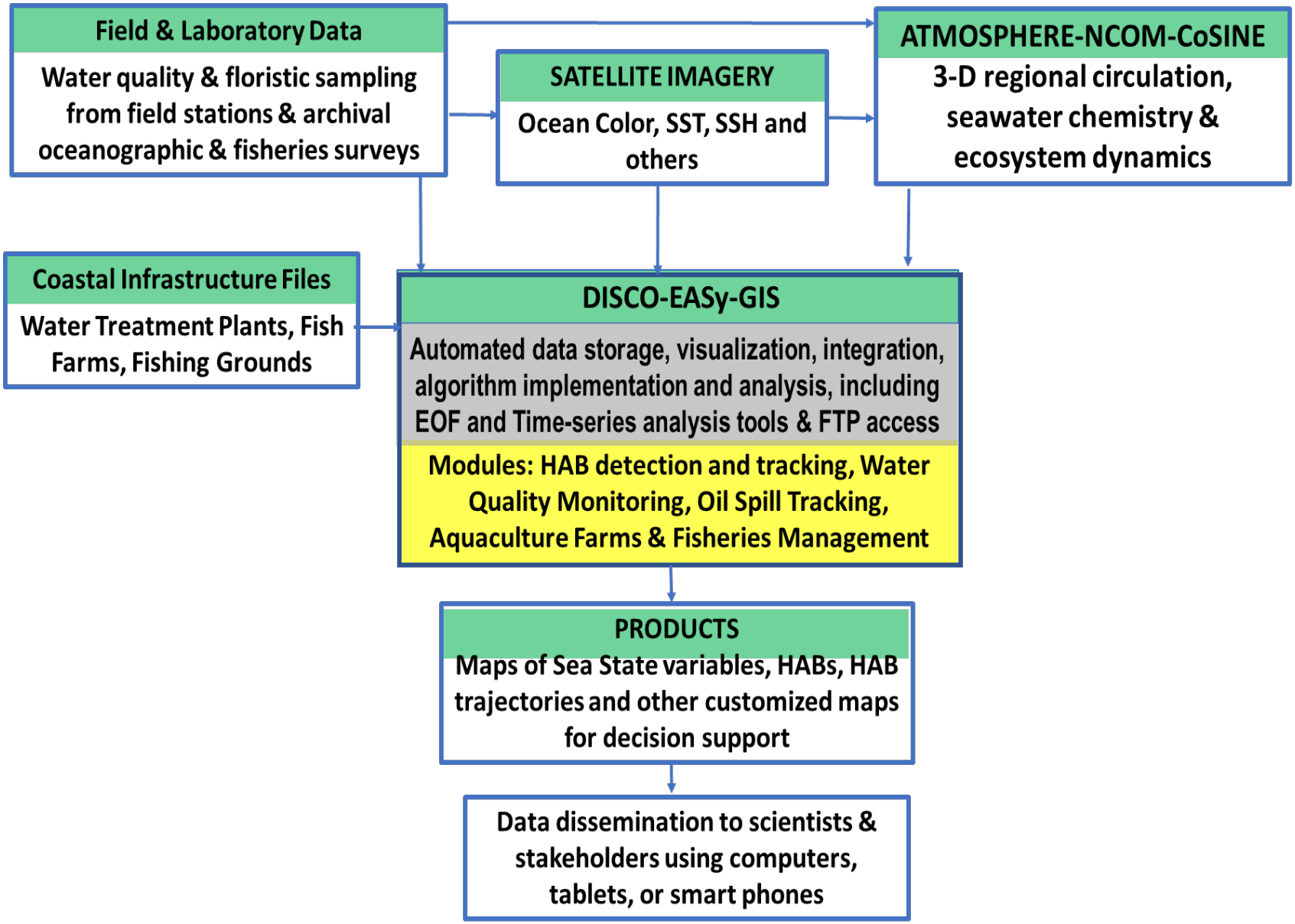
STAKEHOLDERS IN OMAN



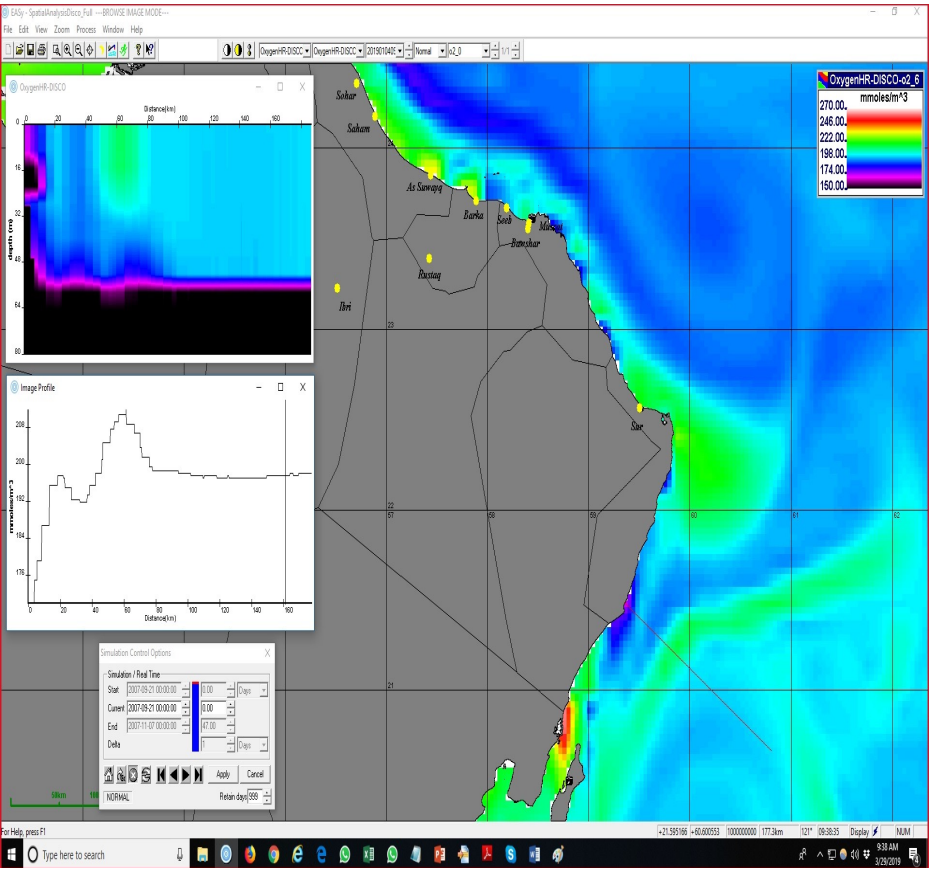
Mechanisms driving regime shifts depicted using "stability landscapes"
Nothern Arabian Sea is past the tipping point

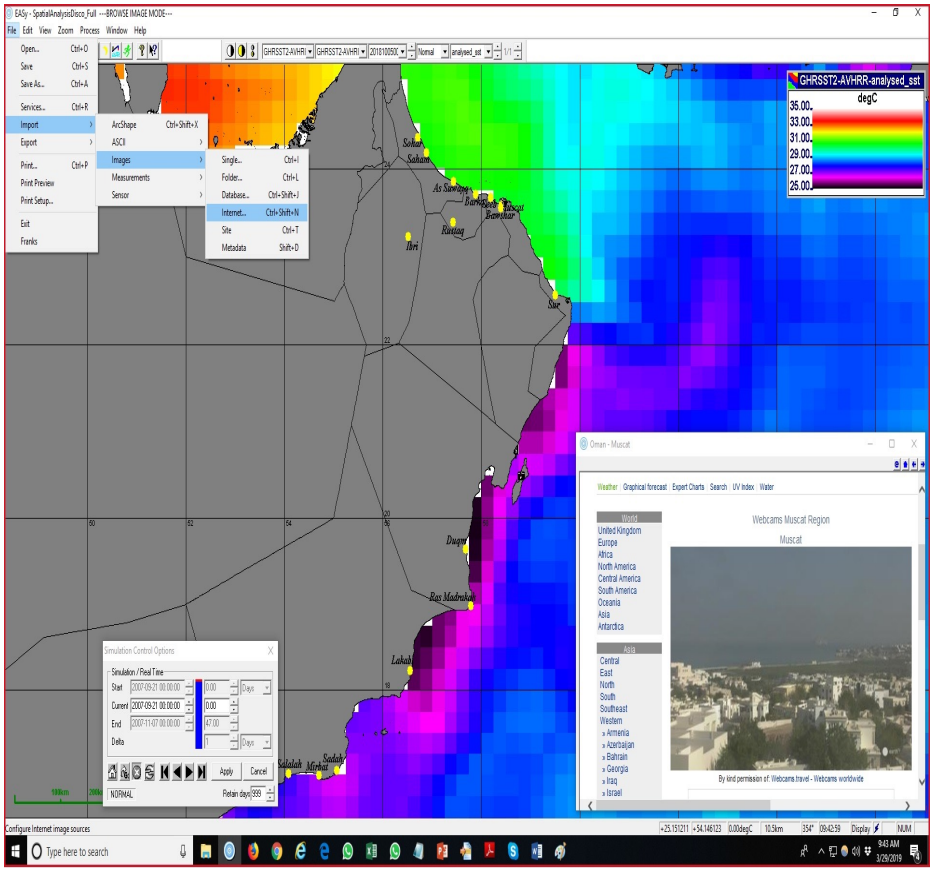


The changing food-web of the Arabian Sea due to green *Noctiluca* blooms

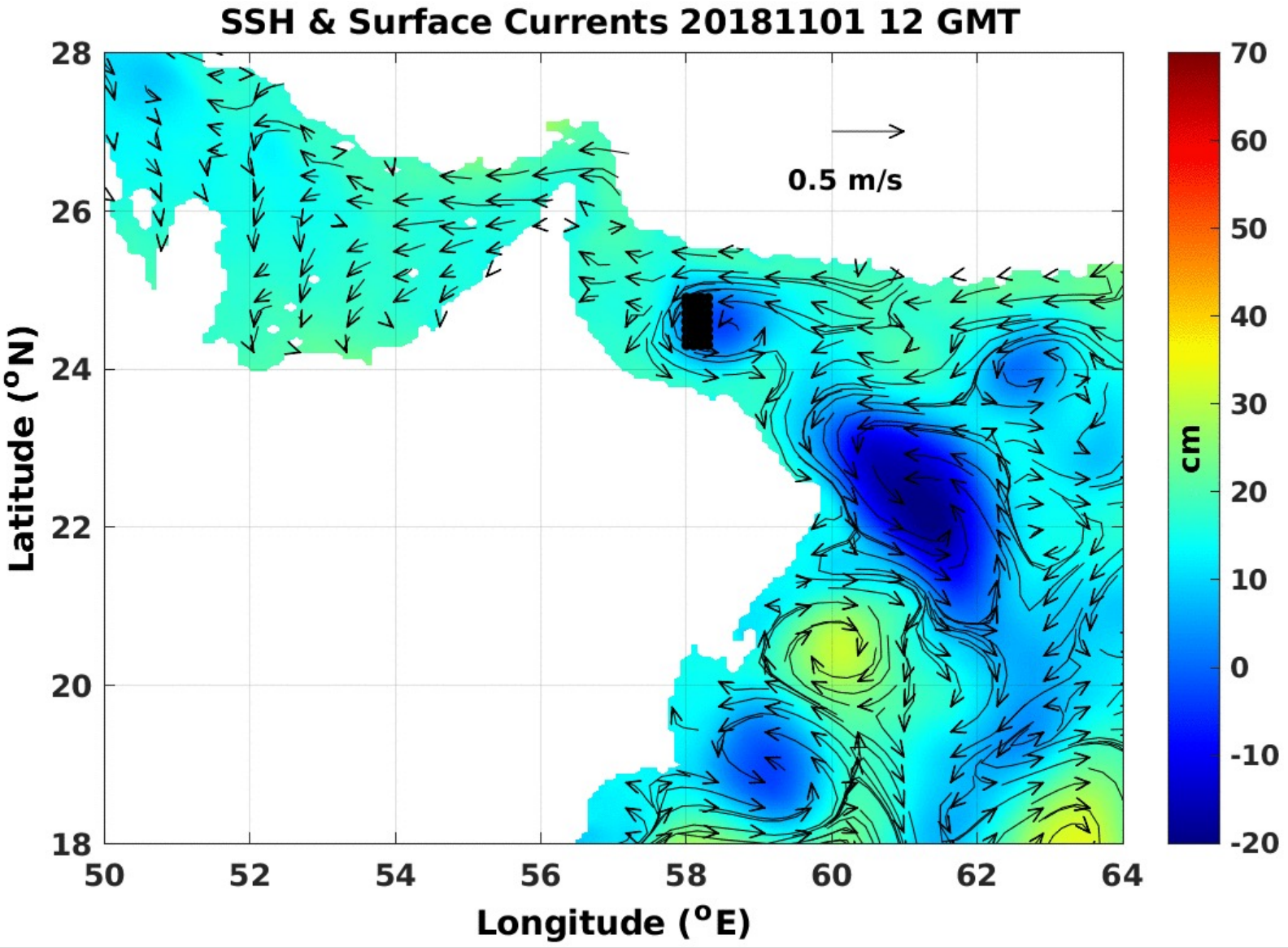


DISCO data flow and product dissemination to Stakeholders

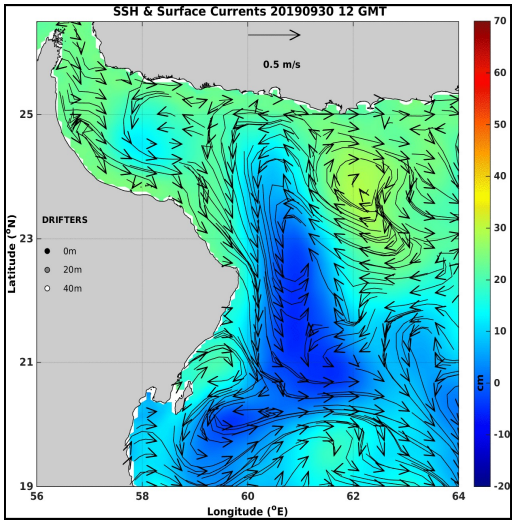


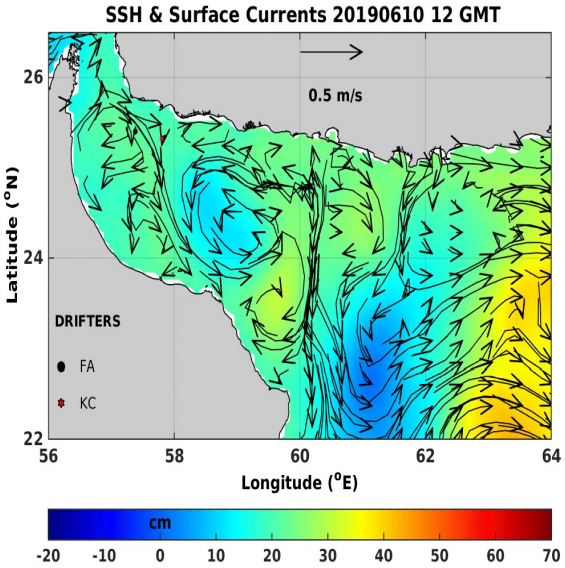


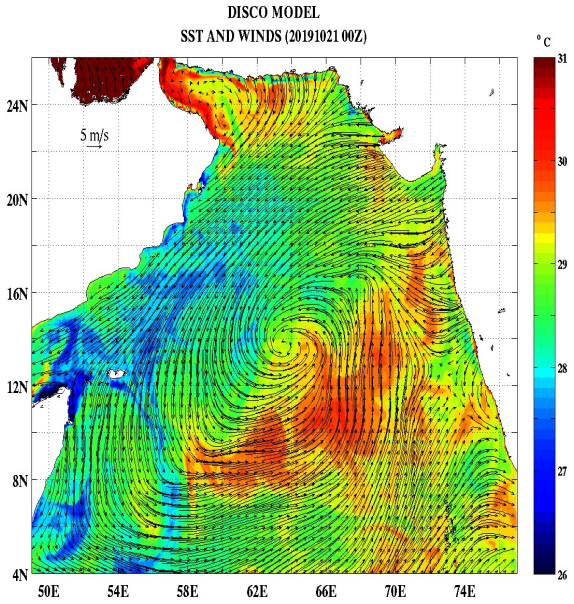
All data are made available via a Windows-based GIS (EASy) Platform that allows for processing, analysis of large volumes of data customized product generation



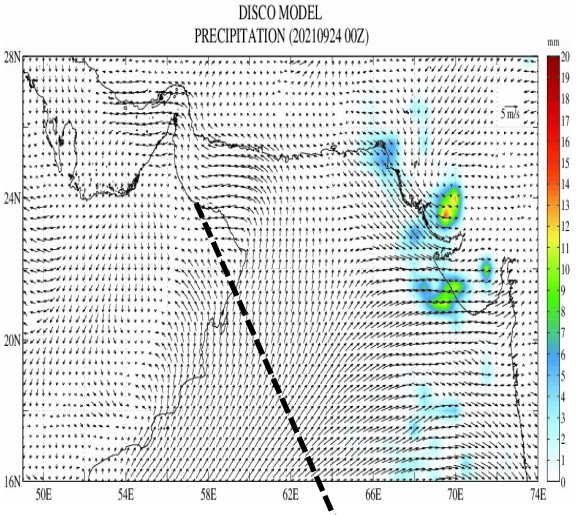
Particle tracking for monitoring bloom dispersal and evolution to be used as an early warning tool

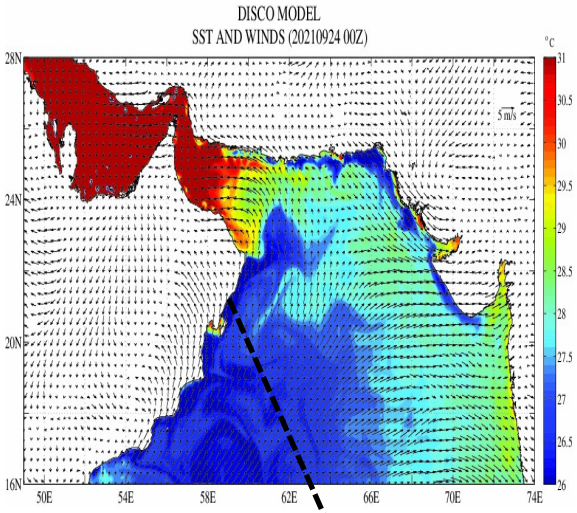


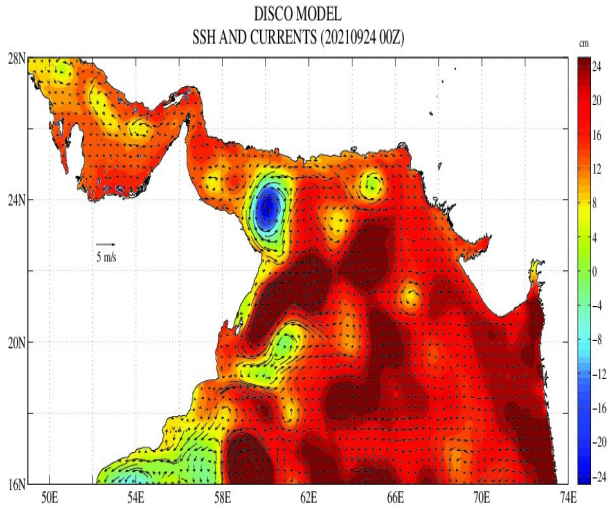




Recent events forecasted by the DISCO system. left) Massive sardine kill in the Bandar Al-Rouda Harbor on Oct 10, 2019, (middle) the fate of the tracked oil spill from the two bombed tankers (FA=Front Altair, KC=Kokuka Courageous) on June 13, 2019; right) the track (observed-pink, forecasted-blue), intensity (forecasted 10 meter winds), and ocean-response (simulated SST) of cyclone Kyarr in late October 2019, followed by cyclone Maha.







الآن : منطقة الغبرة - مسقط !

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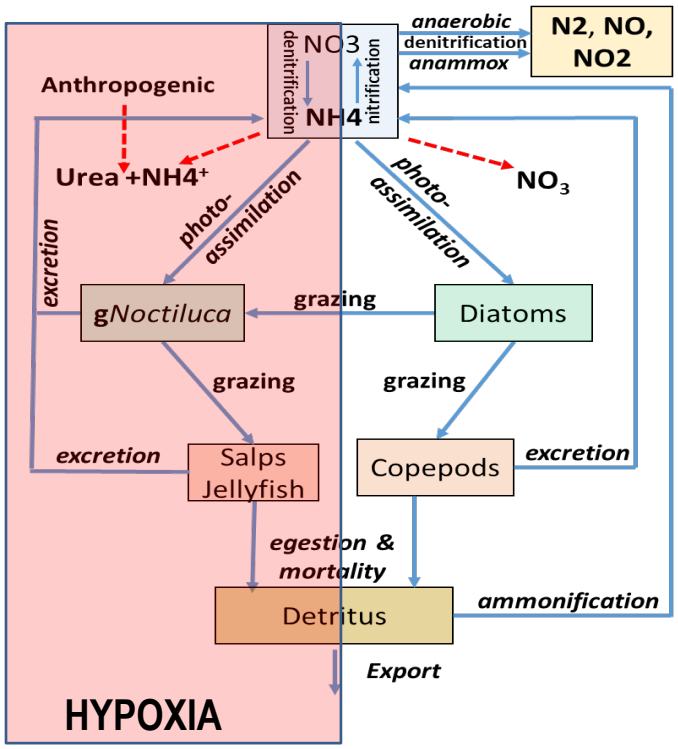
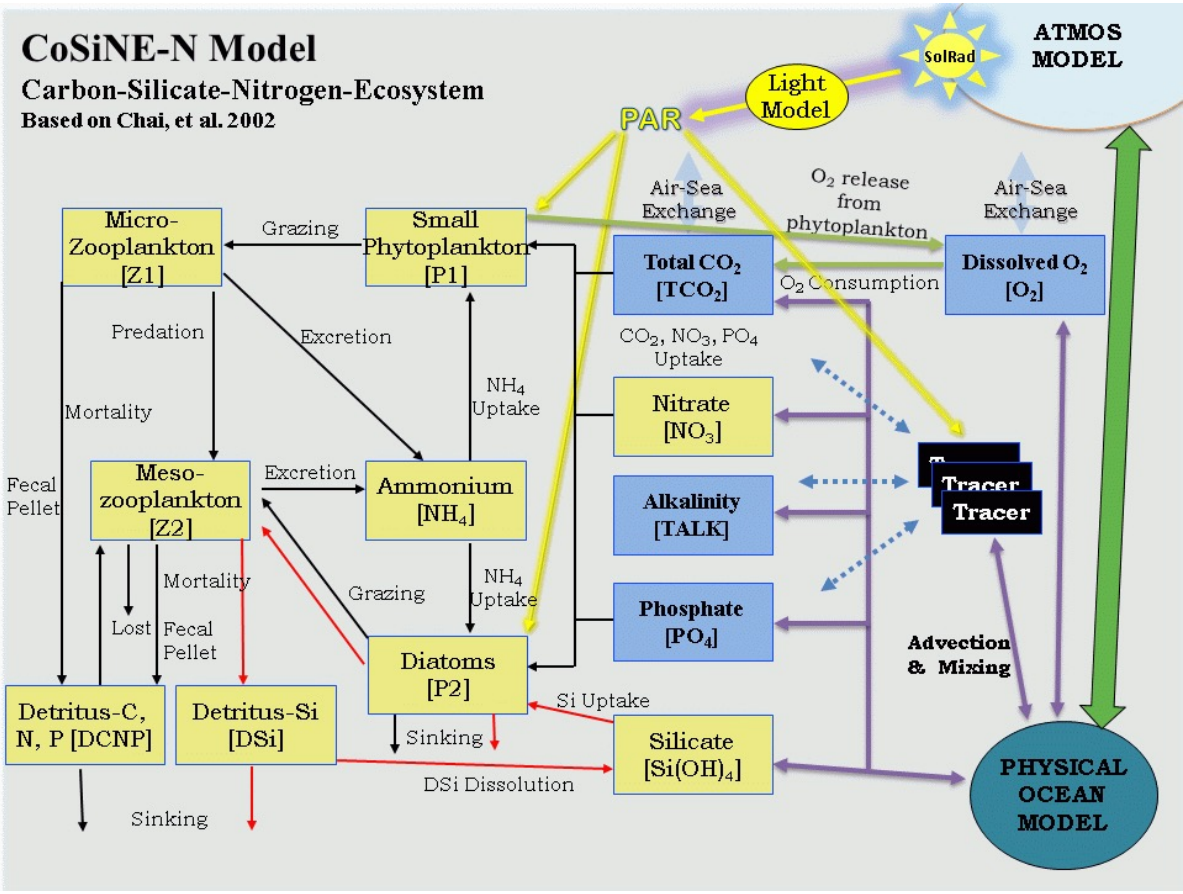
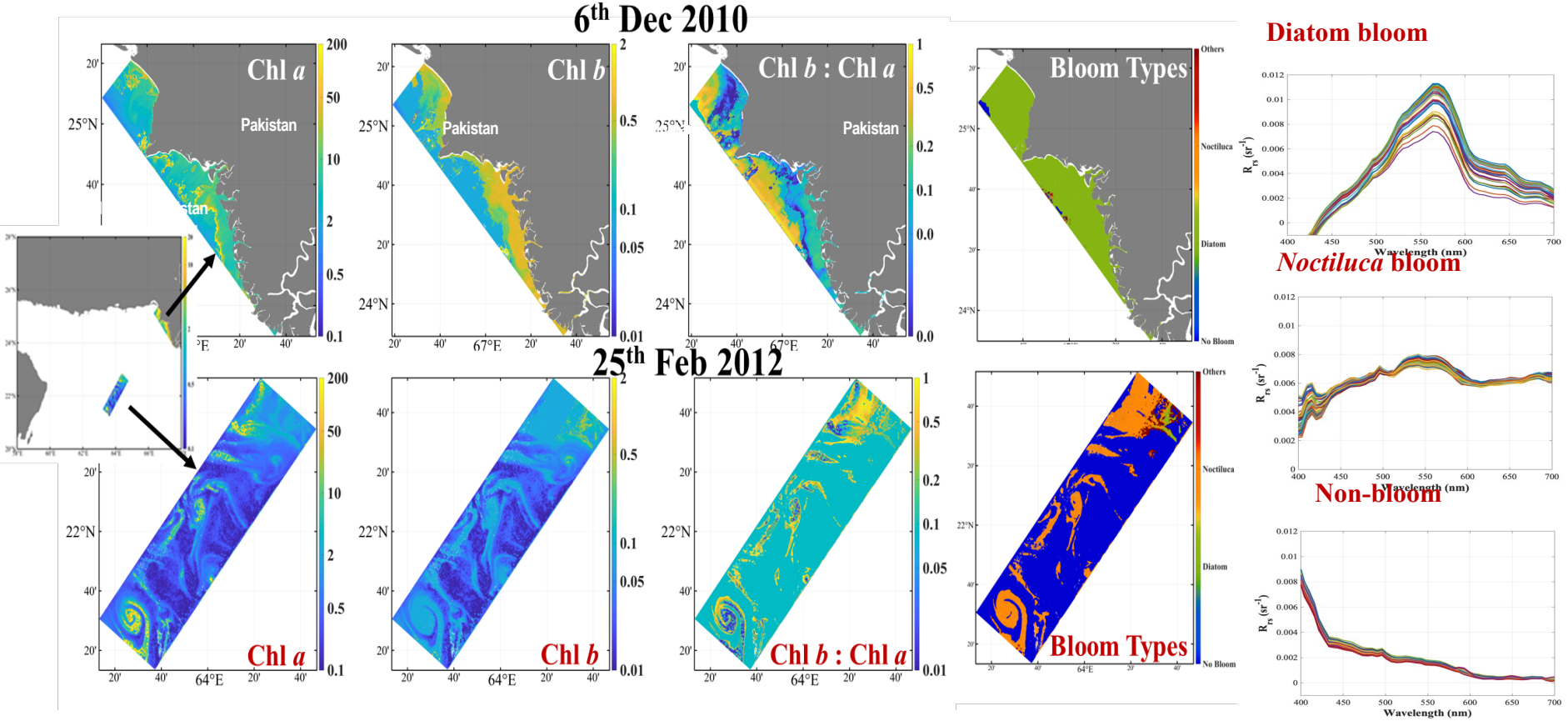
UPDATES TO NCOM-COSiNE MODEL

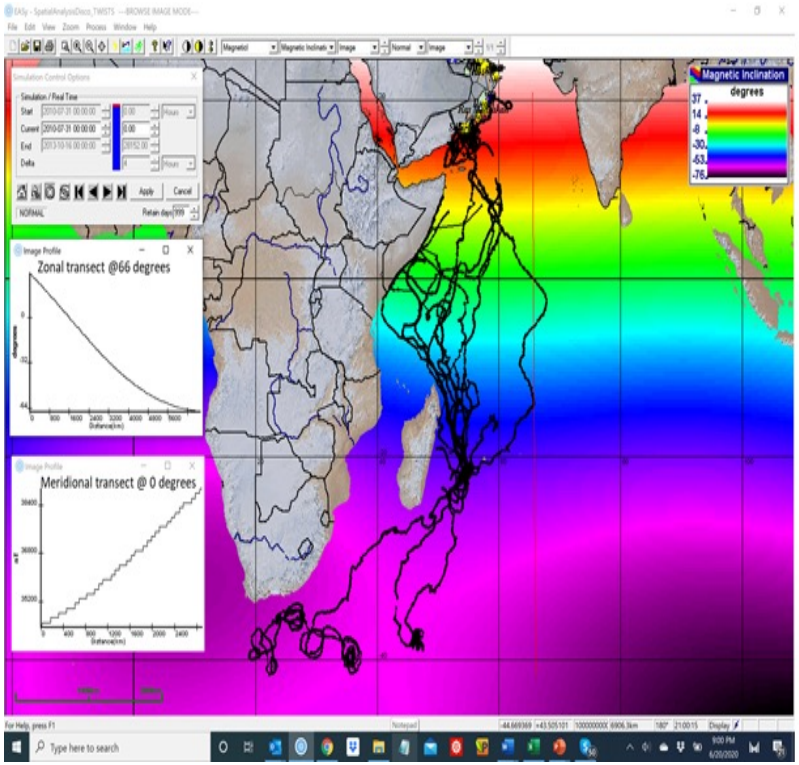
CoSiNE + Mixotrophy

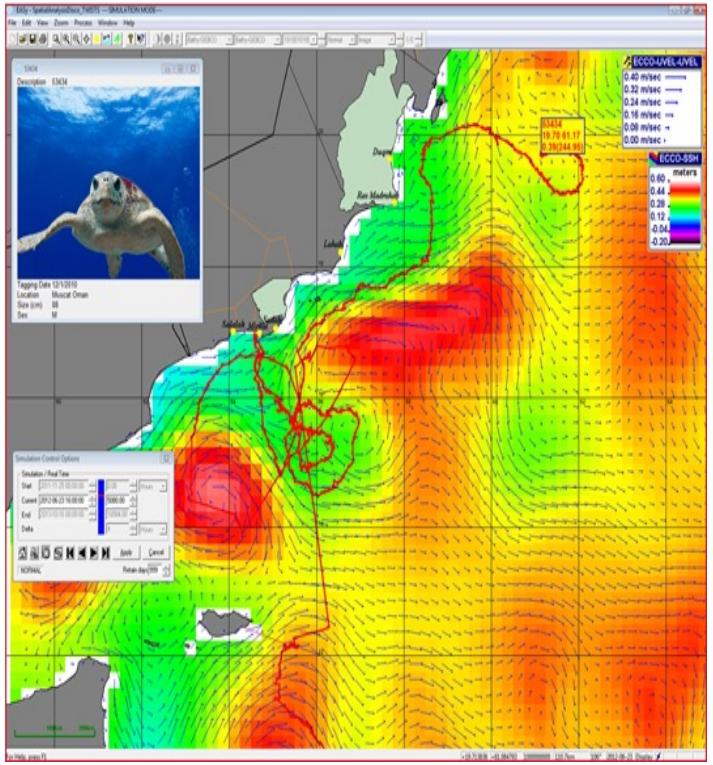




PIGMENT-BASED METHOD FOR DETECTING AND MONITORING OF GREEN *NOCTILUCA* BLOOMS (IN PREP. FOR PACE MISSION)

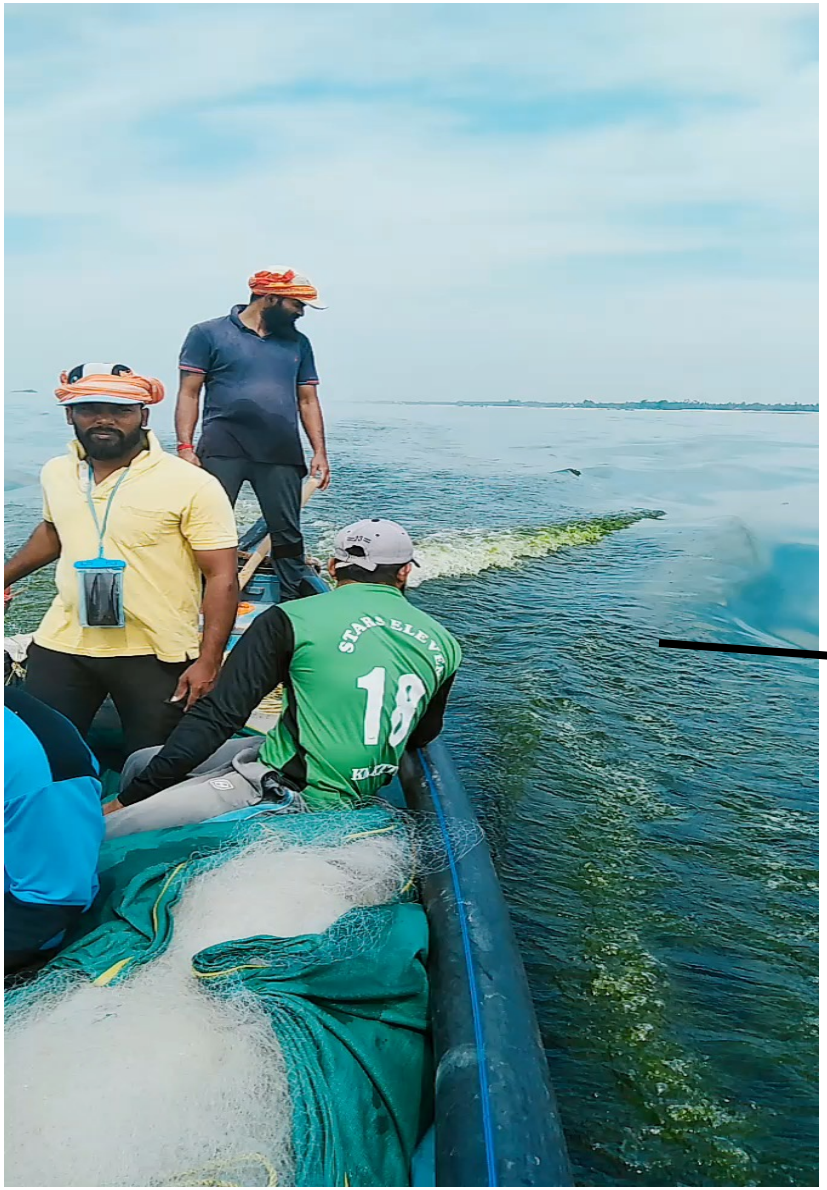


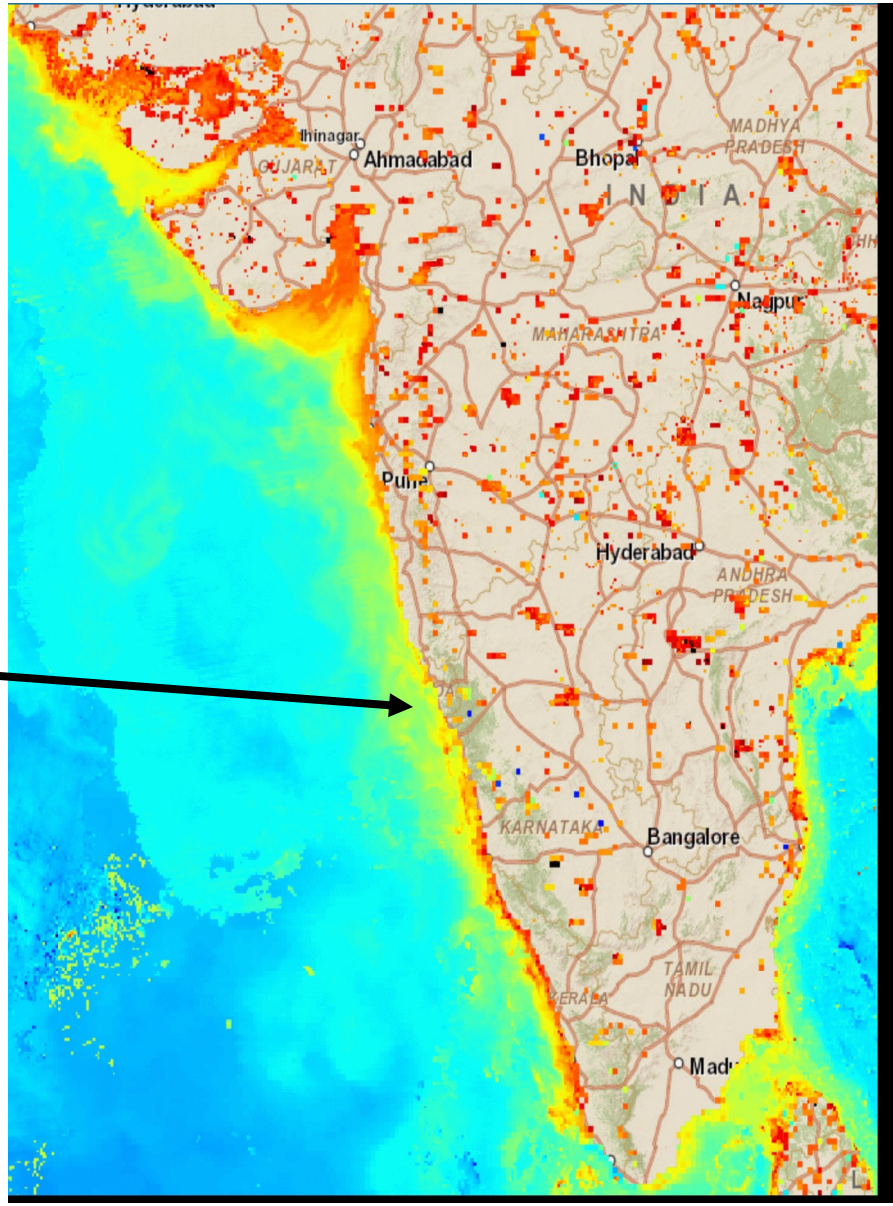




APPLICATION OF DISCO FOR BIODIVERSITY AND CONSERVATION STUDIES

The panel on the left overlays all tracks on a base map of geomagnetic inclination. The panel on the right is a snapshot in the time series of tracks on June 17, 2012 overlaid on a base map of sea surface height and current velocity. The panels suggest that turtles move and navigate by sensing the earth's magnetic field and drift with currents.





Noctiluca **blooms off the west coast of India and N-S progression along the coast – Nov 2020**